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Diffusion and adoption of OER

Authors

Cornelis Adrianus (Kees-Jan) van Dorp

Research Director, European Association of Distance Teaching Universities
kees-jan.vandorp@eadtu.nl

Andy Lane

Director, OpenLearn, Open University
a.b.lane@open.ac.uk

This paper provides insight into how to improve the diffusion of OER through (formal) institutional networks. It does so by examining two cases: (1) MORIL – the Multilingual Open Resources for Independent Learning task force, a Network of Practice that acted as a space for sharing and developing institutional OER strategies, and (2) TESSA – The Teacher Education in Sub Saharan Africa programme, an R&D initiative for OER and course design guidance for teachers and teacher-educators working in Sub-Saharan African countries. The paper reflects on institutional development practices regarding the dimensions and models of collaboration and innovation within communities and networks of practice. A frame of reference is used, which aids the analysis of the OER diffusion and adoption processes in each case.

Tags

Open educational resources, diffusion, adoption, OER competence, communities of practice

1. Introduction

In this paper, the diffusion and adoption of Open Educational Resources (OER), through (formal) institutional networks, is analysed. An obvious way to start, is with an understanding as to what OER actually are. OER are defined as ‘teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge’ [1], and are being created and used throughout the world through the utilisation of digital technologies and open licences. In many cases, it has been major institutions such as the Massachusetts Institute of Technology (MIT) that have been at the forefront of publishing OER, but equally, there are a growing number of individuals who are experimenting with the creation and use of OER. However, the total number of institutions creating and using OER are still small compared to all those who could be involved; and, inevitably adopters have been attempting to collaborate in an area which is based on the philosophy of sharing (see <http://www.ocwconsortium.org>).

Equally, while the sharing of OER has been the original focus of everyone involved, it is increasingly recognised that it is more about open educational practices and how openness is influencing the way institutions teach and students learn (see [2], for a review of open educational practices and resources). As an innovation themselves and as a prompt for further innovation, it is necessary to look at what features might support the successful diffusion of this innovation amongst institutions rather than individuals. To do so, we first review some of the literature relating to diffusion and adoption of innovations, as well as literature on communities and networks of practice. We then review and reflect on two contrasting studies where institutional networks have been critical to innovation diffusion and adoption.

1.1 Diffusion and adoption of OER: a frame of reference

This section introduces a frame of reference, by which to discuss the analysis of OER diffusion and adoption. Diffusion of an innovation can be regarded as a process, an adoption process ([3], [4], [5], and [6]). This process takes place through a series of communication channels over a period of time among members belonging to the same social system. In Roger's Diffusion of Innovations model [3], five phases in the adoption process are distinguished: Knowledge, Persuasion, Decision, Implementation, and Confirmation (Figure 1).

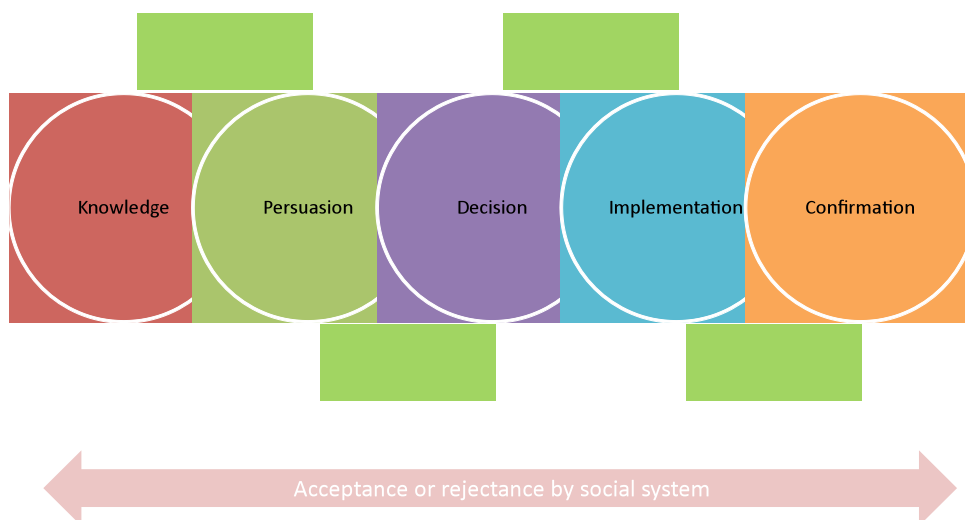


Figure 1: Five phases in the adoption of innovations [3].

Let us now get into the mechanics of the five phases. In the Knowledge Phase, the individual (or institution) is first exposed to an innovation but lacks information about the innovation. During this phase of the process the individual has not been inspired to find out more information about the innovation. In the Persuasion Phase, the individual (or institution) is interested in the innovation and actively seeks information/detail about the innovation. In the Decision Phase, the individual takes the concept of the innovation and weighs the advantages/disadvantages of using the innovation and decides whether to adopt or reject the innovation. Due to the more closed or less open nature of this phase Rogers notes that it is the most difficult stage to acquire empirical evidence. In the Implementation Phase, the individual (or institution) employs the innovation to a varying degree depending on the situation. During this Phase the individual determines the usefulness of the innovation and

may search for further information about it. In the Confirmation Phase, the individual (or institution) finalises their decision to continue using the innovation and may use the innovation to its fullest potential. In addition to this model of adoption, any strategic success of an institution strongly depends on the appropriate organisation of its collective ambition and the presence of core competences. For building and developing new core competences, collective learning is needed according to Hamel and Prahalad [7]. They relate the strategic intent of an organisation i.e., the collective ambition, to the development of core competences and indicate that when an organisation is not yet successful in an area, but wants to move ahead, an investment is

first of all made in strengthening the collective ambition, followed successively by the development of the necessary competences. Figure 2 depicts the relation between the collective OER ambition and the development of necessary OER competence.

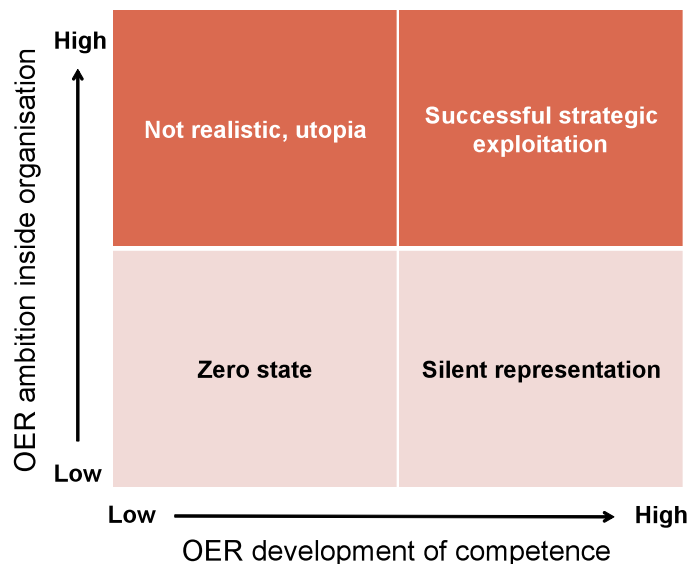


Figure 2: Based on the framework of Hamel and Prahalad [7]: The road to OER success through collective ambition and competence.

Imagine an organisation commencing from a zero state, from which it moves to develop competence in OER. When it is able to develop OER competence among only a small quantum of learners (even be it high competence), it will only manage what we call a 'Silent representation'. The organisational leverage is rather insignificant and the strategic underpinning is negligible. An OER ambition can however be successfully underpinned if the development of OER competence is widely adopted by learners throughout an organisation. In the case of such a collective learning ambition, with a clear strategic intent, the organisation is likely to move from 'Silent representation' towards 'Successful strategic exploitation'. Organisations may also cherish very high level OER ambitions, whereas the 'actual' OER development of competence remains largely underdeveloped. In such situations, the collective learning ambition remains a rather utopic scenario, and as such, the organisation is out of touch with reality.

1.2 Communities and networks of practice

There has been a growing interest in recent years in Communities of Practice (CoP) and Networks of Practice (NoP) in connection with informal knowledge gathering, notably in the fields of education and both knowledge management and innovation within organisations, but also in fields such as healthcare and computer science [8]. Although the idea of communities of practice has been around for many years, it was first made explicit by Lave and Wenger in their work on apprenticeship and situated learning [9]. Around the same time the notion of networks of practice originated in the work of Brown and Duguid [10], who applied the term to the relations among groups of people with looser connections than expected in a CoP. Lave and Wenger [9] define a community of practice as *"a set of relations among persons, activity and world, over time and in relation with other tangential communities of practice"* (p. 98). In simple terms, communities of practice are groups of people who share a common pursuit, activity or concern. Members do not necessarily work together, but form a common identity and understanding through their common interests and interactions. Many different communities of practice exist and we may all be members of several, for example, through our work or hobbies. They are often informal and self-managed. For some communities of practice we may be a core member, whereas for others we may sit on the periphery. Communities of practice are repositories of explicit or formal knowledge as well as the less tangible tacit, informal knowledge, and hold the key to any form

of change process [10]. They are inherently stable and it is this stability that allows learning within and around the community to take place. Wenger [11] identifies three aspects of communities of practice that work together and that may either hinder or enhance learning (Table 1):

Aspects	What does it mean
Mutual engagement	Members come together because they are engaged in actions whose meaning they negotiate with one another. They develop shared practices and are linked through their mutual engagement in such activities.
Joint enterprise	Members work together, explicitly or implicitly, to achieve a negotiated common goal, which may or may not be officially defined.
Shared repertoire	A common history and culture is generated over time by shared practices, stories, tools, concepts and repeated interactions. Writing, routines, rituals, ways of doing things and so on, become a common repository.

Table 1: Three aspects of Communities of Practice

There has been a growing academic interest in what happens beyond communities of practice, in the informal or formal organisational networks within which a community of practice may sit. Podolny and Page [12] define networks as *"any collection of actors that pursue repeated enduring exchange relations with one another and, at the same time, lack a legitimate organisational authority to arbitrate and resolve disputes that may arise during the exchange"* (p. 59). Social network theory views relationships in terms of nodes (individual actors) and ties (the relationships between actors) and views the attributes of the individual actors as less important than their relationships (or ties) with other actors [13]. This is distinct from theories about communities of practice, which focus on an individual's competences and practices. Many networks are viewed as having a structure whereby at the core are those members who are closely tied to each other and at the periphery are members who have more ties to core members than to each other. The concept of networks of practice is distinctive in that it recognises that there may be people beyond an organisation within

which an individual is situated, who share their practice or may influence that practice through their own practices.

However, like CoPs, members often participate in several networks of practice [14]. Networks of practice have the same features as communities of practice (their subset) but may have weaker ties. What binds the network together is shared practice, and extensive shared practice leads to extensive shared know-how ([10], [15], and [14]), although some of that knowhow may come from exchanges with others outside the network. Whilst not usually applied to relationships between organisations there is no reason why a group of institutions cannot come together as a network of practice if they have shared practices and possibly joint or mutual goals. In relation to innovation, Deroian [16] drawing on the work of others, argues that individuals (and potentially institutions) are embedded in a relational network and the opinion of potential innovation adopters is thus subjected to social influence. Through interactions with other potential adopters, opinions on new technologies are formed and shaped. Therefore, much more is involved than simple information transmission in the adoption of an innovation; it involves revisions of judgements, discussions in a wider practice related or socio-economic system, and an individual's receptivity to influence.

2 Case study 1: MORIL

In this section the results of the first study are presented: MORIL. The start-up phase, adoption phase and extended adoption phase are described, along with the experiences gained. Following, the analysis of the case is presented and important conclusions are drawn.

2.1 Introduction

The European Association of Distance Teaching Universities (EADTU) has been working on OER strategies in lifelong open and flexible learning through an EADTU taskforce on Multilingual Open Resources for Independent Learning (MORIL – see <http://moril.eadtu.nl/>) and the European project 'Innovative OER in European Higher Education (OER-HE)'. EADTU is the representative organisation of both the European open and distance learning universities and of the national consortia of higher education institutions active in the field of distance education and e-learning and as such its members have shared practices and goals that are often distinctive and different to campus based universities. As an institutional network it is the

main voice of the community for open and distance higher education and e-learning in Europe. EADTU aims to promote the progress of open and distance education and e-learning and its position in Europe and in the world, through active support to the institutional development of its members and to the European wide co-operation between them in strategic areas. The framework for all this activity is the creation of the European Area of Higher Education (Bologna Declaration), the national and European policies with regard to lifelong learning, the development of competencies for the European citizen and the innovation of e-learning and teaching by the use of ICT.

2.2 MORIL in start-up phase

The action to place OER on the agenda of the Board, Rectors' and Executive meetings of the EADTU came from the Open Universiteit Nederland, in an attempt to learn from The Open University in the UK, which was an early adopter of OER [17]. Preparatory work and discussions as to what this would imply for universities commenced. Simultaneously, the partner universities individually started consultations with experts such as those at The Open University. These experiences were fed back into joint network meetings. The taskforce on OER was an attempt to learn from the early adopters, obtain insight in the pros and cons of OER, and gain experience with ways of working, sharing, and partnering. The primary objective of the taskforce was to extend the commitment base to OER at the partner institutions through dedicated individuals, who would then be able to make preparations for the establishment of a broader consortium. Firstly, aiming at the consolidation of the taskforce, some significant subjects and perspectives were discussed in depth. Secondly, having received commitment from the partners, activities to design a roadmap for the future, commenced, including a lot of effort in dissemination and awareness raising.

2.3 MORIL in adoption phase

The partner universities only really entered the adoption process of OER when the taskforce initiative received financial support from the William and Flora Hewlett Foundation. The initial OER taskforce was renamed MORIL in accordance with the name of the proposal which was submitted to the William and Flora Hewlett Foundation. Through the MORIL grant, momentum could be created within the participating institutions and the exchange of ideas about institutional strategies for OER could be sustained. Additionally, a conceptual model with learn-

ing modules in three tracks was devised: (1) access to fully open courses, (2) access to additional services like competence assessments and access to learning communities, and (3) access to formal tutoring, examinations and certification. The grant by the William and Flora Hewlett Foundation was used as a planning grant, to (also) try to obtain a second (larger) grant, which could help implement the three-track concept across the MO-RIL Consortium, and which would foresee funding for all participating partners and stretch the initiative beyond its start-up scope. To write the new proposal, a core group of the taskforce was delegated to do the essential work. Meetings took place in Brussels, Milton Keynes, Hagen, Heerlen, and in Leuven. While awaiting the outcome of the second bid to the William and Flora Hewlett Foundation, all universities simultaneously continued their own local OER activities. News came, however, that the bid to the William and Flora Hewlett Foundation would not be accepted in its current form. A renewed (second) proposal was submitted, which focused more on the valorisation of the lessons learned and their dissemination towards other universities and networks inside and outside Europe. This proposal was accepted by the William and Flora Hewlett Foundation and enabled EADTU to organise a series of Best-Practice seminars related to OER strategy implementation, OER strategy development and OER capacity building. EADTU (also) obtained organisational and financial support from both the European Commission and UNESCO for this approach.

- The *first* seminar i.e., the strategy implementation seminar, took place on 27-28 May 2008 at The Open University (UK) in Milton Keynes, and was intended for high-end representatives of the Open Universities. Integral cases by The Open University i.e., the case of OpenLearn (<http://www.open.ac.uk/openlearn>) and the Open Universiteit Nederland (the case of OpenER – see <http://www.opener.ou.nl/>), were discussed, dealing with issues like: strategy, sustainability, technology, IP, curriculum, academic participation, quality, and organisational structures. In addition, various institutional approaches of open and distance teaching universities were assessed, using Compendium software based mediation and force field analysis [18].
- The *second* seminar i.e., the strategy development seminar, was held on 28-29 October 2008 in Leuven. It aimed to facilitate knowledge transfer between regular universities and open and distance teaching universities as far as OER (best) practices were concerned. It succeeded in its mission by presentation of institutes leading in OER throughout Europe, in-

cluding panel discussions with representatives of universities and the European Commission. The seminar lived up to the expectations of both regular universities and representatives of university associations.

- The *third* seminar was held on 12-13 March 2009, at the UNESCO Headquarters in Paris. It was headed by the Director of UNESCO's Division of Higher Education. The objective was to explore the potential of OER for improving the provision of education in Africa, Arab States, Asia, the Pacific, and Latin America, incorporating the development of relationships with regional and global networks. The seminar had also been organised to provide input to the ICDE/EADTU Conference (Maastricht, June 2009) and to the 2009 World Conference on Higher Education, organised by UNESCO (Paris, July 2009).

2.4 Towards extended adoption

Innovations such as OER are valuable for the mass of individual learners, yet to date have resisted diffusion in many educational institutions. To sustain the process of adopting OER, and to avoid slow movers from developing an innovation gap, a new European project has been formulated by EADTU. This new European initiative is meant to additionally stimulate institutions to reach a tipping point, by enabling them to continue learning from fast movers. The new project has been approved under the Lifelong Learning Programme (LLP), within the strand Erasmus. The project 'Innovative OER in European Higher Education' (see <http://www.eadtu.nl/oerhe/>) now includes 11 European partners. The project is organised into five study work packages:

1. widening participation i.e., best-practices;
2. multi campus i.e., education associations;
3. internationalisation i.e., team-based development;
4. development of instruments for quality in OER;
5. development of a European course portal.

The new OER HE project enables partners to follow different phases within the innovation cycle as regards: awareness raising, strategy building, institutional frameworks, pedagogic models, business models, and pilot experiments. The project valorises all partners' practices to date and disseminates the successes. The project also delivers a manual on how to deal with OER development.

2.5 Case analysis and conclusion

Almost every open and distance teaching university participated in EADTU taskforce meetings and gatherings. Mostly all were starting at the beginning of the innovation cycle. However, it was the authority of key people and their ability to spread information about OER within the own institution that often played a significant role in adoption. From OpenLearn it was learned that OER could be made functional in the context of university strategies. OER at the OU UK had been lifted to the level of university policy [19]. With OpenLearn being part of policy, other departments were stimulated to become involved as well, making the spread of OER skills and competences throughout the university far easier. The involvement of university Board members in the acceptance and adoption of OER was crucial in this process. Those members which participated in EADTU meetings but had little scope to influence university policy on their own, may have experienced success in exploiting OER on the local departmental level, but experienced great difficulties in scaling up merits to the university as a whole. However, all participating members of the MORIL taskforce did express a certain passion and willingness to make it an institutional success, as well.

In reference to the innovation adoption model of Rogers, we conclude that some institutions had problems, especially in the persuasion phase. The person(s) that needed to persuade the university Board often did not stand in direct relation to that Board, causing an acceptance barrier. With high-level involvement from the first phase onward, such a problem was notably smaller. Turning to the theory of collective ambition and the development of core competences in the case of OER, the bottleneck with many institutions is the mobilisation of the collective ambition, whereby many OER projects remain local and do not reach top management. Because of this, there has been little opportunity for core competencies to be developed. According to Hamel and Prahalad [7], top management must be involved in developing a robust programme for institutional competencies, and must be in place for at least five years. Within MORIL, intermediate changes in top management have reset the process of adoption within institutions, several times. The ability of a university to scale up the merits of successful innovations apparently has a lot to do with authoritative persons and governance. As noted for MORIL, some taskforce participants had direct relations to the university Board and/or were themselves Board members or Rectors. Others acted as representatives or were staff members from departments within the university. The composition of the taskforce, which was not homogene-

ous but rather heterogeneous, made a future assessment of the impact of OER on institutions, difficult.

At this moment, only a few distance teaching universities have incorporated OER in their institutional strategy. As a result, some universities remain climbing the ladder. However, the processes of MORIL do seem to have created a nascent Network of Practice where the opportunities to interact and share information and knowledge has sustained the consideration of OER as an innovation throughout EADTU and also into other networks. Because of this, in 2010, the EADTU launched an extended adoption phase, co-funded by the European Commission, intended to safeguard slow movers from an upcoming innovation gap.

3. Case study 2: TESSA

In this section the results of the second study are presented: TESSA. First, an introduction is given on TESSA, followed by a description of the design and dynamics of TESSA. The section ends with the case analysis and the drawing of conclusions.

3.1 Introduction

This case study is heavily based upon the account in Wolfenden [20] and related publications. Over the last four years The Open University in the UK has been involved in an audience specific OER programme; the Teacher Education in Sub Saharan Africa (TESSA) initiative (see <http://www.tessafrica.net/>). TESSA is a consortium of institutions concerned with the collaborative production of original OER to support teacher development. The major funding for the TESSA initiative has come from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation.

TESSA has five distinct characteristics. First, it is a global consortium, including organisations like the BBC World Service Trust and the Commonwealth of Learning, as well as the South African Institute for Distance Education (SAIDE), but focussed on the needs of teacher education in nine African countries. TESSA is a consortium of 18 national and international organisations including 13 institutions in Sub-Saharan Africa, who are using the TESSA materials in a variety of teacher education programmes (for further details see [TESSA in Use](#)). Second, as an OER initiative it is unique in being audience specific to teachers.

Third, in TESSA the user, the teacher-educator, has been at the centre of the initiative. The vast majority of the OER have been created collaboratively by teacher-educators from across Africa

(over 100 authors have been involved). The developments of both materials and the portal have involved extensive consultation with potential user groups building on local knowledge, materials and approaches. In contrast, most OER projects transfer materials from existing courses to an open platform; often materials in each course originate from only one or two authors. Fourth, the TESSA initiative is creatively exploring the use of OER audio content. Both different formats – drama, interviews, features – and modes of delivery including radio, CD and use of mobile phones. Lastly, significant time and resources is being put into the implementation and use of the resources, an aspect given insufficient attention in many OER initiatives [1].

3.2 TESSA design and dynamics

In TESSA the project design has allowed the consortium to look in detail at issues such as adoption of the resources for different environments and how best ‘users’ can be supported in understanding ways of integrating the materials into what have been termed ‘learning pathways’. TESSA development teams are actively exploring issues of reuse and interoperability. Colleagues across the partner institutions have not been seen as consumers of imported educational material but rather as collaborators in content production, distribution and utilisation. Awareness of the current situation in these institutions together with likely short and medium term contexts for exploitation has been at the centre of TESSA OER development.

The dynamics of the TESSA consortium can be represented by Figure 3. All eighteen partner institutions contribute to the strategic direction of the initiative through regular workshops, meetings and electronic discussions. Each partner insti-

tution is represented on the ‘Partner Advisory Council’ (PAC), the key governance forum for TESSA activity. Support for PAC is provided by a group of academics and administrators from The Open University, UK. Working in a consortium across several countries inevitably brings challenges of coordination and communication; these are vastly increased by the unreliable and uneven infrastructure found in much of sub-Saharan Africa. Regular workshops in different locations across the region have been pivotal in maintaining momentum, building relationships and shared understandings.

Work around the four areas of activity - research, technological development (the TESSA portal), curriculum (TESSA study units) and take up - is determined in detail by a smaller working group for each area. Different partners input to different areas of activity. Some, such as the BBC World Service Trust, have been involved almost exclusively with only one sphere of activity, in this case production of curriculum materials. Other partners have contributed to several strands of activity, represented by the links on the represented diagram. All thirteen institutions in Sub-Saharan Africa involved in teacher education have contributed to activity around implementing use of the OER in courses and programmes. Central to this model is the multi-directional interplay between the concurrent different strands of activity. The structure and nature of the curriculum, for example, has been informed by planned contexts for use (take up), by the forms of technology available for distribution (technical) and by research activity within the project. The latter has included fieldwork exploring the lives of female primary school teachers living and working in rural or semi-rural areas in Ghana, Nigeria, South Africa, Kenya and Sudan.

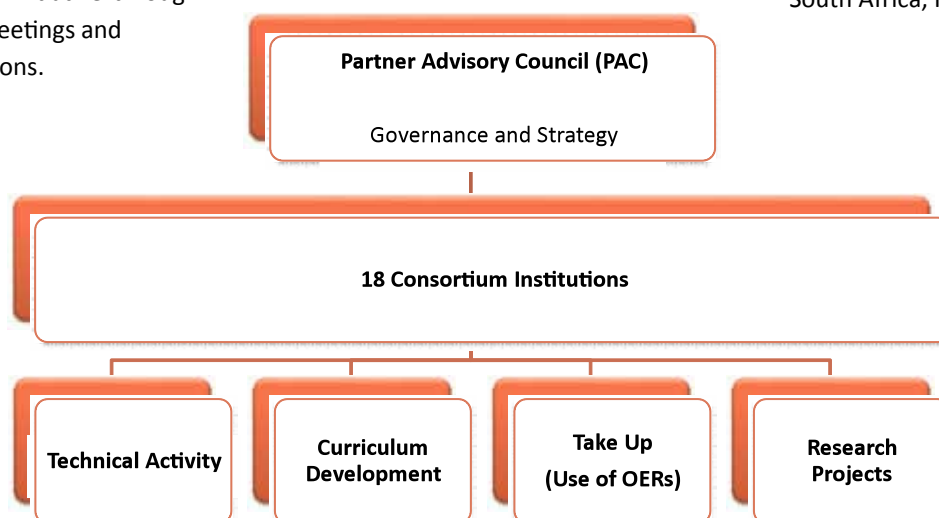


Figure 3: TESSA organisational structure [20].

3.3 Case analysis and conclusion

As with the MORIL project, the TESSA network of practice started with a desire to share the knowledge and experiences of an early OER adopter – The Open University in the UK. Many of the participants were aware of OER but The Open University played a big role in persuading partners that OER were a necessary part of the initiative (when the programme first started, OER did not feature strongly at all) and as described in the case, the decision to adopt OER became central to successful implementation of creating and sharing resources for teacher education. In fact, the whole process of educational resource creation and use was a major innovation for most of the partners and it was the open licensing and judicious use of technologies alongside workshops and meetings designed to share information and knowledge about these practices that helped develop the core competencies within the organisations once the collective ambition was achieved. Equally, the collective ambition within and between the partners was aided by the fact that the consortium aim was the creation of the common resources and shared understanding of educational practices that then enabled different partners to go on and use the OER for a variety of other purposes. This has led to extended adoption of OER and extended practices amongst some of these partners without the need for additional external grant funding. However, it has to be acknowledged, just as with the EADTU network, external grant funding can be critical in maintaining the momentum of adoption and sustaining the network of practice. It is also the case that the structure and governance arrangements for the consortium, working variously across a number of activities, has been important in developing both communities and networks of practice amongst the partners, which is also being carried over in some cases to the work of individual partners in particular countries. In fact, while EADTU is a long established network compared to that created specifically and more recently for TESSA, the very openness of OER and associated open educational practices means that people are more likely to be aware of them, can more readily find out more information and see examples of adoption by others (including the reasons for doing so) and how they have implemented the innovation [21]. At the same time, the common goal or joint enterprise, represented by distance teaching or teacher education in the two cases, moves the relationship on from one of just cooperation to greater collaboration amongst the members of the institutional network. So, while these were formal networks for the common purpose, the openness also enabled aspects of informality between members in sharing information about innovations.

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Phone: +34 933 670 400

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